Claim Amendments

Please amend claims 1, 5, 7, 10, 11, 13-17, and 25 as follows:

Please cancel claims 9 and 20-24 as follows:

Please add new claims 26-31 as follows:

U.S.S.N. 10/644,356

Claims as Amended

1. (currently amended) A method for selectively altering a thickness of a radiation sensitive polymer layer comprising the steps of:

providing a substrate comprising a first density of semiconductor features and a second density of semiconductor features wherein said first density is greater than said second density;

~~providing a substrate comprising~~ forming at least one radiation sensitive polymer layer having a first thickness topography to cover said semiconductor features;

determining a thickness of the first thickness topography;

exposing the at least one radiation sensitive polymer layer through a mask having a predetermined radiant energy transmittance distribution to selectively expose ~~predetermined areas of the at least one sensitive polymer layer~~ said polymer layer over said second density of semiconductor features to a different ~~predetermined~~ radiant energy dosage[[s]]compared to

said polymer layer over said first density of semiconductor features; ~~and,~~

developing the at least one radiation sensitive polymer layer to ~~alter the first thickness topography of the at least one radiation sensitive polymer layer~~ to produce a second thickness topography wherein said second thickness topography covers said semiconductor features and has a higher degree of planarity than said first thickness topography; and,

then performing an etch process to produce a third thickness topography.

2. (original) The method of claim 1, wherein the predetermined radiant energy transmittance distribution is determined according to the first thickness topography.

3. (original) The method of claim 2, wherein the first thickness topography is determined according to one of profilometry or interferometry or scanning electron microscope.

4. (original) The method of claim 1, wherein the step of exposing produces a differential material removal rate in the step of

developing according to the predetermined radiant energy transmittance distribution.

5. (currently amended) The method of claim 4, wherein the step of developing ~~comprise at least one~~ is selected from the group consisting of ablation, vaporization, self-development, baking, and chemical dissolution.

6. (original) The method of claim 1, wherein the mask comprises subresolution features with a predetermined density distribution.

7. (currently amended) The method of claim 6, wherein the subresolution features ~~comprise at least one~~ are selected from the group consisting of lines, holes and islands.

8. (original) The method of claim 1, wherein the mask comprises semitransparent areas with a predetermined density distribution.

9. cancelled.

10. (currently amended) The method of claim 1, wherein the ~~substrate comprises a semiconductor wafer having a process surface~~ semiconductor features comprise~~ing~~ at least one of

surface protruding and surface penetrating features.

11. (currently amended) The method of claim 10, wherein the surface penetrating features comprise at least one of Via[[s]] openings and trench openings.

12. (original) The method of claim 10, wherein the surface protruding features comprise at least one of gate electrodes and metal lines.

13. (currently amended) The method of claim 1, wherein the step of exposing ~~comprise at least one~~ is selected from the group consisting of alignment, stepping, and scanning.

14. (currently amended) The method of claim 1, wherein the step of exposing ~~comprises at least one~~ is selected from the group consisting of a step and repeat method, a mirror projection alignment method, a proximity alignment method, a contact alignment method, and a step and stitch exposure method.

15. (currently amended) A method for selectively altering the thickness topography of a radiation sensitive polymer layer comprising the steps of:

providing a semiconductor wafer having a process surface comprising ~~at least one of surface protruding and surface penetrating features~~ a first density of via openings and a second density of via openings formed in a dielectric layer, said first density greater than said second density;

blanket depositing a radiation sensitive polymer layer to fill and cover said vias at a first thickness;

determining ~~an initial~~ a thickness topography of the radiation sensitive polymer layer;

determining a desired radiant energy dosage to deliver to portions of the radiation sensitive polymer layer to ~~selectively alter predetermined thickness portions of the radiation sensitive polymer layer in a subsequent developing process~~ to produce a subsequent planarized thickness topography of the radiation sensitive polymer layer;

providing an exposure mask for delivering the desired radiant energy dosage;

selectively exposing portions of the radiation sensitive polymer layer through the exposure mask to deliver the desired radiant energy dosage including a relatively higher radiant energy dosage to an area of said polymer layer overlying said second density; ~~and,~~

developing the radiation sensitive polymer layer to produce the subsequent planarized thickness topography wherein said planarized thickness topography comprises a thickness portion above and covering said vias; and,

then performing an etchback process to form via plugs at least partially filling said vias.

16. (currently amended) The method of claim 1, wherein the step of exposing produces [[a]] differential radiation sensitive polymer layer thickness change rates in the step of developing according to the desired radiant energy dosage.

17. (currently amended) The method of claim 15, wherein the step of developing ~~comprises at least one~~ is selected from the group consisting of ablation, vaporization, self-development, baking, and chemical dissolution.

18. (original) The method of claim 15, wherein the exposure mask comprises subresolution features with a predetermined density distribution.

19. (original) The method of claim 15, wherein the exposure mask comprises semitransparent areas with a predetermined density distribution.

20. cancelled

21. cancelled

22. cancelled

23. cancelled

24. cancelled

25. (currently amended) The method of claim 15, wherein the steps of determining ~~an initial~~ a thickness topography through the step of developing the radiation sensitive polymer layer are repeated to form said subsequent planarized thickness topography.

26. (new) The method of claim 1, wherein the etch process produces via plugs at least partially filling vias formed in a dielectric layer.

27. (new) The method of claim 1, wherein said first thickness is within a thickness window to produce a linear change in thickness with respect to said predetermined radiant energy transmittance distribution in the step of developing.

28. (new) The method of claim 15, wherein the etchback process produces via plugs partially filling vias formed in a dielectric layer.

29. (new) The method of claim 15, wherein said first thickness is within a thickness window to produces a linear change in thickness with respect to said desired radiant energy dosage in the step of developing.

30. (new) A method for selectively altering a thickness of a radiation sensitive polymer layer comprising the steps of:

providing a substrate comprising semiconductor features;

forming a radiation sensitive polymer layer having a first thickness topography to cover said semiconductor features; said first thickness topography within a thickness window sufficient to produce a linear change in thickness with respect to a desired radiant energy dosage in a subsequent development process;

then measuring said first thickness topography;

then determining said desired radiant energy dosage of said polymer layer;

then exposing the polymer layer through a mask to provide said desired radiant energy dosage; and,

then developing the at least one radiation sensitive polymer layer in said subsequent development process to produce a second thickness wherein said second thickness topography has a higher degree of planarity than said first thickness topography.

31. (new) The method of claim 30, further comprising an etchback process to form a third thickness topography.